CLASS SPECIFICATION

TITLE	GRADE	EEO-4	CODE
STAFF I, ASSOCIATE ENGINEER	**35***	**B**	**6.229**

OPTIONS: **Department of Transportation**

A. Construction Division
B. Environmental Services Division
C. Location, Photogrammetry & Cartography Division
D. Maintenance Division
E. Materials and Testing Division
F. Operations Analysis Division
G. Road Design Division
H. Safety Engineering Division
I. Structural Design Division
J. Districts
K. Rotational Engineering Program

Department of Conservation and Natural Resources

L. Division of Environmental Protection
M. Division of State Parks
N. Division of Water Planning
O. Division of Water Resources

Under general supervision, perform engineering work requiring technical training and experience and/or basic professional engineering knowledge and abilities; exercise, to a limited extent, independent technical judgment; in the Department of Transportation, may be involved in a rotational program to provide experience and training within the various disciplines of transportation engineering.

Perform engineering functions requiring the exercise of judgment in the analysis of diverse data that impact routine and non-routine operations requiring interpretation of policy and procedures. Activities consist of duties that produce a product or provide a service used by others in making decisions. Positions at this level deal with others at similar levels or external peers and higher supervisory levels for the purpose of answering questions requiring explanations or limited interpretations of standard procedures and solving problems involving some conflict requiring interpretation/application of policy.

DEPARTMENT OF TRANSPORTATION

Environmental Services Division

Air Quality: Prepare environmental clearance reports for department projects; determine compliance and conformity of projects with the Clean Air Act of 1990 and the National Ambient Air Quality standards; develop and prepare material site applications; collect and compile air borne particulate data from high volume samples; and submit data to management for review.

Perform field studies and determine the number of sites to be sampled, the specific location of each site, the type of sample taken, whether or not meteorological data should be obtained, and the type of collection method to use.

*** Reflects a 2-grade, special salary adjustment authorized by the 2001 Legislature to improve recruitment and retention.**

DEPARTMENT OF TRANSPORTATION (cont'd)

Environmental Services Division (cont'd)
Noise Control: Develop noise level models and evaluate noise reduction value, economic factors and height requirements of sound walls to determine cost effectiveness.

Conduct existing noise readings to determine impacted and sensitive areas of the project for site locations; schedule for series of timed site readings; and take ambient readings at field site for comparison to predicted noise levels.

Assist in preparing noise reports by preparing graphics from scaled photos; adapting new alignments and barriers and compiling data received from ambient readings, noise models, and other divisions into summaries and tables.

Hazardous Waste: Participate in performing hazardous material/waste site assessments to determine location of existing or new right-of-way; perform field investigations to identify potential risks; participate in the review of information gathered during the investigative process to determine if further assessment is needed and, if so, acquire the services of the consultant on contract for site assessments; participate in determining the scope of work to be performed by the consultant; and observe consultant operations to ensure adherence to contract.

Maintain hazardous material/waste operations to include developing and updating site plans regarding storage and usage of materials; communicating with regulatory agencies to obtain guidance, learn of new or upcoming regulations, or respond to complaints, questions or comments; assisting department personnel regarding hazardous/waste related problems; maintaining hazardous waste record keeping system to ensure compliance with federal, State and local hazardous waste requirements; preparing reports, letters, memoranda, work plans and presentations for federal, State and local agencies, department personnel and the public; inspecting treatment, storage and disposal facilities used by the department; and training department personnel to properly handle hazardous wastes.

Materials and Testing Division
Field Exploration: Perform geological studies to determine potential material site locations; assess pre-established sites to determine the physical character of the geologic materials, measure the dimensions and quantity of material and identify potential environmental, cultural, legal and access constraints; analyze field collected data to determine the suitability of geologic materials for construction; and write summary reports, preliminary reports and other documents related to construction material occurrence, character and method of location to provide the department with information necessary to aid in the selection of construction material sites.

Prepare for acquisition of material by performing a property ownership search; calculate rough quantities needed to ensure aggregate source area is adequate; verify the location of the site by conducting on site search for known points and marks; meet with owners and conduct on-site survey of property to determine if there are limitations or factors that affect site use; and obtain clearances for acquisitions.

Roadbed Design: Provide material deposit service to determine if material deposit is a viable source for future projects; formulate a comprehensive mining plan for each new deposit located on federal lands to include excavation methods, processing plants, dust control, bonding requirements and reclamation methods; provide material deposit data for contractors, county personnel and the public; prepare material specifications to determine what materials will be required for a project; and participate in field reviews of current projects to review construction methods and practices.

Lab Services: Direct the statewide quality assurance program for the division; monitor the current status of certification and supporting documentation submitted by the contractor for each project; document and process reports to ensure proper sampling quantities on a contract and to record failing materials; research

DEPARTMENT OF TRANSPORTATION (cont'd)

Materials and Testing Division (cont'd)

Lab Services (cont'd)
specification requirements and reference standard plans and specifications to provide engineers and contractors with a formulary for use of material requirements to be met in order to accept a contract; prepare letters of acceptance; and notify the Federal Highway Administration that all materials were accepted and the job was completed within federal guidelines.

Ensure that lab personnel are certified to meet the American Association of State Highway and Transportation Officials specifications by keeping active records on personnel with respect to origination dates, lab functions, longevity within the lab and test methods they are qualified to employ.

Road Design Division
Roadway Design: Develop a complete set of working plans, specifications and estimates for a roadway construction project; design special details for aspects of the project that are not covered in the standard plans for road and bridge construction; make recommendations in the roadway design to reduce roadside hazards; perform capacity analysis by using current and projected traffic counts in conjunction with site data to determine such elements as the number of traffic lanes and traffic channelization, level of service and traffic delays; and prepare structure lists for incorporation into the contract documents.

Prepare preliminary and agreement estimates; update estimates as costs and changes are added to reflect the current total cost of a project; and perform economic analysis by making detailed cost comparisons of alternate designs to fund the best benefit/cost ratio.

Landscape, Maintenance, Railroad and Erosion Control: Design landscape, maintenance, railroad and erosion control projects; participate in preliminary design field studies to determine the scope of projects; design traffic control to facilitate safe and continuous flow of vehicular and pedestrian traffic through the work zone; prepare preliminary and engineer's estimate to obtain a final estimate to be bid; organize final plans and submit for printing; prepare a revised agreement estimate after the contract is awarded; prepare, when necessary, an agreement for consultant work or other outside entity for the sharing of funding, maintenance, or the construction of a project; and review consultant design work to ensure adherence to departmental policies and procedures.

Safety Engineering Division
Statistical Development Programs: Conduct safety project and special study evaluations and write evaluation reports for review and approval by management; develop hazard indicator values for high hazard locations and provide research analysis on identified locations; conduct special studies on potential safety problem locations; identify accident reduction factors; and provide factors for the Planning Division to incorporate into short and long term project selection reports.

Railroad Safety Engineering Programs: Establish a Hazardous Railroad/Highway Crossing Priority Index by compiling data to include a field review inventory, accident history, average daily traffic, average daily train traffic, human factors and surface rating review; entering data into computer system; and preparing data for diagnostic review to establish which crossings need safety improvements.

Establish steps to be taken in Railroad Safety Projects; monitor projects and participate in the final inspection process.

Update the Federal Railroad Administration on changes in the status of crossings in Nevada by conducting comparative studies; transferring updated information on to the American Association of Railroads Crossing inventory forms; and supplying the Federal Railroad Administration and railroad companies with updated information.

DEPARTMENT OF TRANSPORTATION (cont'd)

Rotational Engineering Program
The Rotational Engineering Program is a training and development program designed to familiarize incumbents with all aspects of the Nevada Department of Transportation activities. Incumbents rotate through various divisions within the department and work on projects as assigned within the division. Upon the satisfactory completion of the program, incumbents are offered an open position in one of the department's engineering divisions.

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

Division of Environmental Protection
Make field investigations and inspections of waste water treatment facilities, industrial operations for air pollution control and solid and hazardous waste processing and disposal facilities; collect samples, analyze data and prepare reports; review engineering plans and specifications for subdivisions, waste water treatment works, air pollution controls and solid and hazardous waste facilities.

Division of Water Resources
Analyze more routine applications to appropriate or change groundwater and prepare a recommendation for review by the supervisor on whether or not the application should be approved and, if so, what specific conditions should be placed on the approval; prepare a detailed map, illustrating the point of diversion and place of use of the application, other water rights in the area, and surface water features; complete a fundamental hydrologic analysis to determine the effect on the groundwater level in the immediate area.

Process applications for extension of time, proof of completion of work and protests to the granting of an application; ensure the completeness and accuracy of the submitted information, returning documents if found incomplete or deficient, reviewing well logs and other sources of information for comparative purposes.

Review proofs of beneficial use including performing field inspections to check the accuracy of submitted information to include surveyed locations and hydrologic information.

Provide public assistance in water right matters to include explaining to the public local hydrological and engineering conditions and the pertinent federal, State and local laws and regulations and specific policies and procedures of water resources.

Perform related duties as assigned.

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MINIMUM QUALIFICATIONS

SPECIAL NOTES AND REQUIREMENTS:

* Positions within this class may require specialized education and experience which will be identified at the time of recruitment.

* Specific duties and knowledge, skills and abilities for those options not described in this class specification may be determined at the time positions are classified. Positions being classified must meet the entry level knowledge, skills and abilities common to all options. Judgment must be applied in determining the degree to which a specific position being classified meets the intent of the class concept.

* Employees in this class who are not registered professional engineers may not represent themselves as such to other persons or entities.

MINIMUM QUALIFICATIONS (cont'd)

ALL OPTIONS

EDUCATION AND EXPERIENCE: Bachelor's degree from an accredited college or university in civil engineering or a closely related engineering field; **OR** certified as an Engineering Intern and four years of sub-professional engineering experience in civil engineering or a closely related engineering field; **OR** four years of experience at the Engineering Technician II level or above; **OR** an equivalent combination of education and experience. *(See Special Notes and Requirements)*

ENTRY LEVEL KNOWLEDGE, SKILLS AND ABILITIES (required at time of application):

ALL OPTIONS

Knowledge of: basic engineering principles and practices; metric system units and the U.S. equivalents; practical application of fractions, percentages, ratios and proportions, logarithms, algebra, geometry and trigonometry; graph and table formatting. **Ability to:** make computations and calculations involving the application of engineering principles; plan, organize and schedule to accomplish established objectives; read and understand technical reports and maps; write technical reports; compose correspondence for transmittal to other governmental agencies; work under the stress of frequent interruptions and/or distractions; work within a cartesian coordinate system; work as part of a team; establish and maintain cooperative working relationships with other department members; organize material and information in a systematic way to optimize efficiency and minimize duplication of effort; work independently and follow through on assignments; interact diplomatically with public in potentially hostile situations.

DEPARTMENT OF TRANSPORTATION

Environmental Services Division
Air Quality - Physical ability to: lift heavy objects and walk on all kinds of terrain with a pack.

Noise Control - Ability to: create graphic displays from existing aerial photos and plans to depict proposed roadways, barriers, and sound walls for public use.

Hazardous Waste - Knowledge of: regulations that govern hazardous materials/waste substances; hazardous materials/waste substances terminology; Occupational Safety and Health Administration regulations.

Materials and Testing Division
Field Exploration - General knowledge of: surveying techniques and practices sufficient to locate property corners, determine elevations and distances from established reference points and calculate areas and volumes. **Ability to:** drive an automobile or pickup truck over long distances on surfaces ranging from highways to off-road areas.

Lab Services - Working knowledge of: highway materials specifications and testing procedures; testing terminology.

Road Design Division
Roadway Design - Working knowledge of: design manuals and standard plans. **General knowledge of:** construction practices. **Knowledge of:** surveying practices. **Ability to:** modify and/or adapt standard designs, procedures or methods to fit special project requirements; comprehend technical data such as materials and testing and hydrological reports; read technical, legal and engineering reports, such as lab reports, highway agreements and legal land descriptions. **Skill in:** interpreting field book data; deriving quantities using dimensional analysis; reading and interpreting engineering plans; the use of basic engineering instruments and tools.

MINIMUM QUALIFICATIONS (cont'd)

ENTRY LEVEL KNOWLEDGE, SKILLS AND ABILITIES (cont'd)

DEPARTMENT OF TRANSPORTATION (cont'd)

Safety Engineering
Statistical Development Programs - General knowledge of: Nevada's network of federal and State highways. **Ability to:** interpret roadway contract plans.

Railroad Safety Engineering Programs - Knowledge of: at-grade railroad crossing surface rehabilitation, track structure, automatic gate/cantilever circuitry and federal standards for crossing protection. **Ability to:** calculate project material quantities, labor rates and project costs; interpret roadway contract plans.

Division of Environmental Protection
Knowledge of: basic engineering principles and practices related to water pollution control, air pollution control and waste management; basic principles of chemistry, hydraulics, hydrology, geology, bacteriology and meteorology as applied to environmental protection. **Ability to:** interpret, analyze and summarize federal and State laws, regulations, technical reports and other sources of information pertaining to environmental fields; prepare clear, concise reports and correspondence.

Division of Water Resources
General knowledge of: hydrology and hydrographic features sufficient to recognize what terrain features indicate about groundwater movement. **Knowledge of:** surveying and engineering drafting sufficient to read maps to interpret and transfer information; surveying conventions and symbols; water measuring techniques in open channels, conducts and wells. **Ability to:** perform basic hydraulic calculations; read a map sufficient for precise navigation in an off-road scenario.

FULL PERFORMANCE KNOWLEDGE, SKILLS AND ABILITIES (typically acquired on the job):

ALL OPTIONS

Knowledge of: where to go within the organization for needed information; computer hardware and software programs necessary to complete job assignments. **Ability to:** read, comprehend and apply federal, State and local laws, rules and regulations; perform a variety of duties, often changing from one task to another of a different nature; make judgments pertaining to data validity and consistency; operate mainframe and personal computers; respond to questions in a group setting to provide information or explain procedures and policies; analyze technical information, problems, situations, practices or procedures to identify relevant concerns, formulate logical and objective conclusions, and recognize alternatives and their implications.

DEPARTMENT OF TRANSPORTATION

Environmental Services Division
Air Quality - Knowledge of: air monitoring equipment uses, needs, operations and functions; federal regulations on ambient air quality surveillance; meteorology, emissions, chemistry, and physics, and their inter-relationships; safety precautions necessary in handling carbon monoxide gas and high pressure gas cylinders; proper procedures and appropriate calibration methods for, and operation of, instruments and equipment used in air quality studies; construction practices, concrete and asphalt batch plants; engineering principles pertinent to the air quality program, and their relationship to the environment. **Ability to:** learn and apply new, complex procedures and programs related to the air quality program; research specifications, schematics, drawings and manuals, and apply them to the specific needs of a project; research outside information and make appropriate evaluations as to its possible uses.

MINIMUM QUALIFICATIONS (cont'd)

FULL PERFORMANCE KNOWLEDGE, SKILLS AND ABILITIES (cont'd)

DEPARTMENT OF TRANSPORTATION

Environmental Services Division (cont'd)
Noise Control - Knowledge of: proper operation and calibration methods of equipment and instruments used in noise level studies. **Ability to:** use electronic instrumentation such as noise analyzer, wind meter, speed meter, calibrator and related equipment.

Hazardous Waste - Knowledge of: chemistry and incompatible chemicals; use personal protective equipment including respirators. **Ability to:** recognize an emergency situation and take appropriate action; create contracts/agreements for hazardous waste functions; present training classes in a pleasant, knowledgeable, and understandable manner.

Materials and Testing Division - Field Exploration
Knowledge of: laboratory materials testing procedures; federal and State regulations which may restrict or permit land use activities with respect to exploration of materials or material pit or quarry development. **Ability to:** use and maintain material site inventory records; obtain information which describes the legal ownership status of land; establish and maintain mutually cooperative working relationships with individuals representing agencies which own lands where materials may be located, for the purpose of obtaining permission to conduct exploration.

Roadbed Design - Knowledge of: related outside agencies, such as Bureau of Land Management, county agencies and Federal Highway Administration. **Ability to:** read technical documents and manuals such as standard specifications and contract special provisions; interpret plans and specifications pertaining to roadway construction.

Lab Services - Working knowledge of: research in materials and highway construction methods. **Ability to:** make judgmental decisions concerning the emphasis to be placed upon each separate material or item incorporated into each construction project; maintain dialogue with field personnel concerning submission of certifications and reports of tests performed.

Road Design Division
Working knowledge of: traffic control procedural manuals. **General knowledge of:** standard specifications. **Knowledge of:** department policy memoranda. **Ability to:** compare design work to standards and judge whether it is similar to or different from prescribed standards. **Skill in:** cost estimating, planning and preparation of a project with multiple funding sources.

Safety Engineering
Working knowledge of: various statistical test methods used for preparing project evaluation and special study reports. **General knowledge of:** traffic control systems and their operations. **Knowledge of:** the cause and effect relationship between vehicle momentum and accident occurrence; drivers' behavioral characteristics when associated with changes in roadway environment; highway capacity terms and technology. **Ability to:** compute accident rates, expose factors, vehicle miles of travel, accident reduction factors, and hazard index values to conduct ongoing highway safety programs; calibrate and program digital and computerized distance measuring instruments.

Railroad Safety Engineering Programs - Knowledge of: how to acquire and compile data to formulate a priority hazardous index; the policies set by the Federal Railroad Administration for updating their files. **Ability to:** write documents to establish standards, follow policies of engineering for railroad and highway construction, maintain a file for each project, and interact with concerned parties for each project.

MINIMUM QUALIFICATIONS (cont'd)

FULL PERFORMANCE KNOWLEDGE, SKILLS AND ABILITIES (cont'd)

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

Division of Environmental Protection
Knowledge of: federal and State laws, regulations, technical reports and other sources of information pertaining to environmental fields (air, water, waste).

Division of Water Resources
General knowledge of: the division's book records and publications; well drilling practices sufficient to monitor well driller's regulatory compliance. **Knowledge of:** the Nevada Water Law. **Ability to:** recognize specific hydraulic engineering hardware in the field; sketch a workable map from a known landmark to a found point previously noted on any map; recognize man-made features which indicate the pressure of a well or well driller; operate four-wheel drive vehicle in a variety of on and off road conditions.

This class specification is used for classification, recruitment and examination purposes. It is not to be considered a substitute for work performance standards for positions assigned to this class.

6.229

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